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Special points of interest:

- Hydstra User Group Meetings Confirmed in August/September
- USGS Signs Cooperative Technical Assistance Agreement with Hydstra America Inc.
- Hydstra/TS v9.0 to be released in August
- Hydstra/TSM v4.1 to be released in July

Global Community

By Bill Steen, Client Services Manager

After working with a product for over 17 years you can become complacent with its origins, its contributing factors for success, and the changes that have occurred. But on reflection the key factor behind the product's development and success is the people who have used our products and services. And now more than ever, with installations in over 20 countries, these influences are moulding the company to meet the demands of a global community.

From Hydstra's perspective this has influenced the way in which we do business. Our products and services are constantly being updated to reflect the diverse technical environments, country specific work practices and cultural differences that we encounter around the world. The Hydstra web page is now in three languages and the software language translation functionality has been vastly improved to cater for the increased demand of the software. Hydstra services a global community.

We only need to look at the following contents of the newsletter. Hydstra will be hosting User Group meetings in 5 countries, we have international articles, and many of the new features within Hydstra/TS and Hydstra/TSM have been the direct result of international installations. 15 Character site ID's, improved telemetry functionality, and use of sub-variables in ratings benefit all users yet many of us don't realise their origins.

So I invite everyone to take the opportunity and attend one of the 6 global user group meetings and hear first hand what's new and how other users utilise the products. But I urge you all to not only attend but to contribute, as we rely on your contribution to improve our products and services and set future directions.

Global Hydstra User Group

The dates for the Hydstra User Group meetings have been confirmed. This year we are expanding the user group to include meetings in the United Kingdom and South Africa, in addition to those in Australia, New Zealand and the USA.

The Hydstra User Group is an opportunity for Hydstra Users to learn about innovations in the software, provide input on where the products should be heading in the future and to discuss data collection and data management issues with others in the environmental monitoring industry.

The confirmed meeting dates are as follows:

Aug 27/28	Australian User Group in Hobart, Tasmania
Sep 01	New Zealand User Group in Auckland, New Zealand
Sep 03	North American (West Coast) User Group in Sacramento, California
Sep 05	North American (East Coast) User Group in Tampa, Florida
Sep 09	European User Group in London, United Kingdom
Sep 11	Southern Africa User Group in Pretoria, South Africa

More detailed information about each meeting will be distributed in the coming weeks. Please contact support@hydstra.com if you would like more information.

United States Geological Survey Signs Cooperative Technical Assistance Agreement with Hydstra America Inc.

By Patrick Hayes, Vice-President, Hydstra America Inc.

The U. S. Geological Survey (USGS) collects streamgage records at more than 7,000 active streamgages across the United States. The resulting data are stored in the National Water Information System (NWIS). NWIS runs in UNIX, and data can be processed over a network of workstations and fileservers at Survey offices throughout the United States. The system is composed of four subsystems. The subsystem known as the Automated Data-Processing System (ADAPS) consists of a collection of computer programs for capturing, processing/computing, editing and quality assuring data. ADAPS also stores and retrieves the data into/from the databases, similar to Hydstra Time-Series (TS) software, but in the UNIX environment. The ADAPS programs that allow the visualization, graphical editing, and analysis of time-series data are in need of enhancement.

This agreement will allow USGS personnel to take advantage of the graphical user interface and enhanced features found in Hydstra/TS

Hydstra America, Inc. has negotiated a Cooperative Technical Assistance (CTA) Agreement with USGS. An interface between ADAPS and the Hydstra/TS software will be developed under the CTA. This interface will allow USGS personnel to move data between the two systems, and take advantage of the graphical user interface (GUI) and enhanced features found in the Hydstra/TS package, particularly as it relates to measurements and rating curve development. The ratings area of Hydstra has a ratings workbench which allows the user to work up the rating curves in a graphical fashion. Additionally, the USGS uses stage and time shifts with its ratings curves. Hydstra has previously developed a graphical stage and time shift suite of programs which have been in use for several years by those USGS-cooperators who run Hydstra/TS. The CTA also provides for Hydstra staff to work with USGS hydrographers to learn the USGS methods and procedures for developing and editing rating curves. This may result in modifications to the Hydstra graphical ratings tool to ensure its processes conform to USGS scientific business packages.

This process will significantly advance Hydstra's graphical stage and time shift program, HYRATSHF, to reflect the USGS' most current thinking

The project is well along at present. An interface using XML has been developed and is currently being tested. The next step will be installation of the interface and Hydstra at USGS' Reston headquarters for in situ testing. This will be followed by field testing at three USGS District Offices around the U.S.

This process will allow actual users of the data to employ the system and Hydstra's suite of programs in their work, and return the finished product to the NWIS database. Through these efforts we also expect to further advance the graphical stage and time shift programs, known as HYRATSHF, to reflect the USGS' most current thinking.

The in situ testing commenced in July and will be followed by deployment to the District Offices in early September. The evaluation and use period is expected to run six months.

Through the efforts to date, the USGS and Hydstra have identified an immediate application of Hydstra/TS for one of USGS' overseas clients, Honduras. In this U.S. Agency for International Development (USAID) project, Hydstra is providing Hydstra/TS to the Survey for use in Honduras. The program there is a follow-on to the work that the Survey conducted after the devastating Hurricane Mitch rolled through Central America a few years ago. Hydstra is currently installing the system and training USGS personnel to use Hydstra/TS in Honduras.

Do You Have Something to Contribute to the Hydstra User Group?

If you are doing something interesting or innovative with your environmental data then you might like to consider submitting a technical paper to present at one of the Hydstra User Group meetings. A time of twenty minutes will be allocated per presentation with a five-minute period for follow-up questions and discussion. We will also be accommodating shorter presentations of ten minutes with five minutes for questions and discussions. Please contact support@hydstra.com if you would like to make a presentation at HUG.

The Hydstra User Group is your opportunity to share what you are doing with others in the industry.

Support for Microsoft Windows NT & Windows 98

Hydstra users running Windows NT 4 Workstation or Windows 98 should be aware that Microsoft is withdrawing support for both products in the near future. Windows NT 4 Workstation became unsupported on June 30, 2003 and Windows 98 will be supported until January 16, 2004.

If you are running either of these operating systems then we strongly recommend that you upgrade to Windows 2000 or Windows XP Professional in the near future. Windows 2000 will be supported until at least March 31, 2007 and Windows XP Professional has support until at least December 31, 2008.

For more information visit www.microsoft.com/windows/lifecycleconsumer.mspx

Validating Quality Codes in Hydstra/TS

It has come to our attention that some users have managed to create time-series data with invalid quality codes such as 0 and 255. Both of these are not valid, as quality codes must be between 1 and 254. It is also possible that data has codes which were once valid, but which have since been removed or changed. Some bad values such as 0 and 255 were allowed in because of inadequate validation of quality codes in earlier versions of Hydstra/TS. However the problems arose, they may cause you grief in Hydstra 9, and you should fix the bad values. We suggest you regularly run HYAUDIT across all your data with the [Quality Codes Registered] test.

If you encounter a small amount of data with invalid quality codes you can fix the problems manually from the workbench, using the File/Repair option. Before opening any suspect files, tick the "Options/Configuration/Check Time Series for Unregistered Codes" checkbox in the workbench. If you have a serious problem and dozens or hundreds of offending files, use HYTRAN to map the offending codes in a batch process.

You should also validate all your database tables using the Validate option in the various HYMANAGEs to ensure you are not attempting to store bad quality codes. Tables can be rectified manually if there are few problems, or using HYDBUTIL REPLACE if you have lots, but be VERY careful if you use HYDBUTIL and be sure to make good backups first! Tables that contain quality codes include GAUGINGS, GAUGMEAS, LOGCHAN, LOGPOLL, RESDFLT, RESENTRY, RESULTS and WREHOUSE.

What Hydstra/TS v9 means to you

Hydstra/TS version 9 is due for release in August. The system has already been handed over from the Hydstra Product Development team to the Client Services team for final acceptance testing and we will start distributing it once it has passed our internal testing regime.

Version 9 includes many new features, including:

- HYXPLORE—An integrated explorer-style interface
- Switchable Datasets—allows you to keep separate time series archives and work file areas for data from different sources, and quickly switch between them from HYMENU, HYXPLORE or the Data Manager's Workbench.
- Perl Datasource—enables you to dynamically acquire time-series data from any source
- 15 character site IDs—makes it possible to extend your site naming rules
- New syntax for Site Lists—makes it easier to specify site lists (HYSTNS Expressions)
- New data transformation codes—for storing values that relate to the following interval
- Rating tables can be applied to sub-variables—allows each different subvariable to be converted in its own way
- New HYDLL functions to read Hydstra tables—allow scripts to safely access data from Hydstra tables
- Many new functions in MODSYN

The Version 9 release will impact on anybody running Hydstra/TS version 7, as version 7 will become unsupported once the new version is released. If you are running Hydstra/TS version 7 then you should plan an upgrade as soon as possible. You will need to upgrade to version 8 before you can upgrade to version 9. Please contact support@hydstra.com if you require a version 8 upgrade. Remember that all upgrade versions are provided free to licenced Hydstra users.

While the version 9 system will have gone through comprehensive testing before it is released, clients should plan their own acceptance tests to ensure that the software operates as expected in their environment. For most clients Hydstra software is a mission-critical system and while we do a lot of testing in a range of different environments we can never guarantee a smooth transition in all environments. This can only be assured by setting up your own test environment.

If you have limited time or resources, then Hydstra can help with the upgrade process. We can physically upgrade the software, test your supporting processes and train your staff in new procedures and new programs. Please contact support@hydstra.com for more information.

Hydstra/TSM—Version 4.1 Release

By Chris Misson, Product Development Manager

Version 4.1 of Hydstra/TSM is in the final stages of testing and will be released in late July. This version includes a significant number of important new features including:

Improved Security

- Access to time series data can now be controlled for specific variables if required.
- From any database form it is now possible to display all users/groups who have access to the current record as well as the type of access (select, Update, Insert, Delete);

Improved Query capability

Provision has been added to enable queries based on partial string matches to be applied to "object fields". This applies to a number of database fields including:

- LoggerProtocols.Protocol
- TSTRansfers.SrcID/OutID
- TaskElements.Action

Improved Telemetry features

- Control of verbosity levels on messages issued by communications and logger drivers;
- Ability to monitor in detail all character transmissions involved in a telemetry session;
- Logging of polling session summaries to facilitate checks on average call lengths, reliability etc.

Better support for databases spanning time zones

Storage of UTC time offsets for locations now enables output with respect to different time zones if required.

Generalised Scripts (KPI Reporting)

Generalised scripts provide enormous flexibility, particularly when setup as automated tasks run by Scheduler. One particular application is to run processes scanning the entire database for checking on key performance indicators (KPIs).

KPIs will vary between different organisations but may include:

- number of ratings not up to date;
- number of telemetry calls exceeding 5 minutes;
- time series that have not recently been QA checked;
- number of water quality sites that have not been sampled recently;
- number of sites with less than 2 gaugings in past year.

The possibilities are endless, however the flexibility of the scripts enables users to establish whatever checks/measures are appropriate. Scripts can output results in a variety of ways including as text, HTML or even as a time series.

On-Archive Actions

On-Archive Actions are scripts triggered whenever any new data is transferred to a time series variable. These scripts can be used to perform real-time quality control checks, initiate re-running of flow-forecasts based on new input data or for raising alarms based on incoming values/trends.

Multi-variate Time Series Editor

A new time series editor has been included that allows several time series to be edited in a single session. This editor may be setup under the favourites menu, so that it displays concurrent data for several related time series for the purpose of cross-checking. The period retrieved can be specified as generic dates and times. This editor has the option of having all traces on a single axis or with separate axes for each trace.

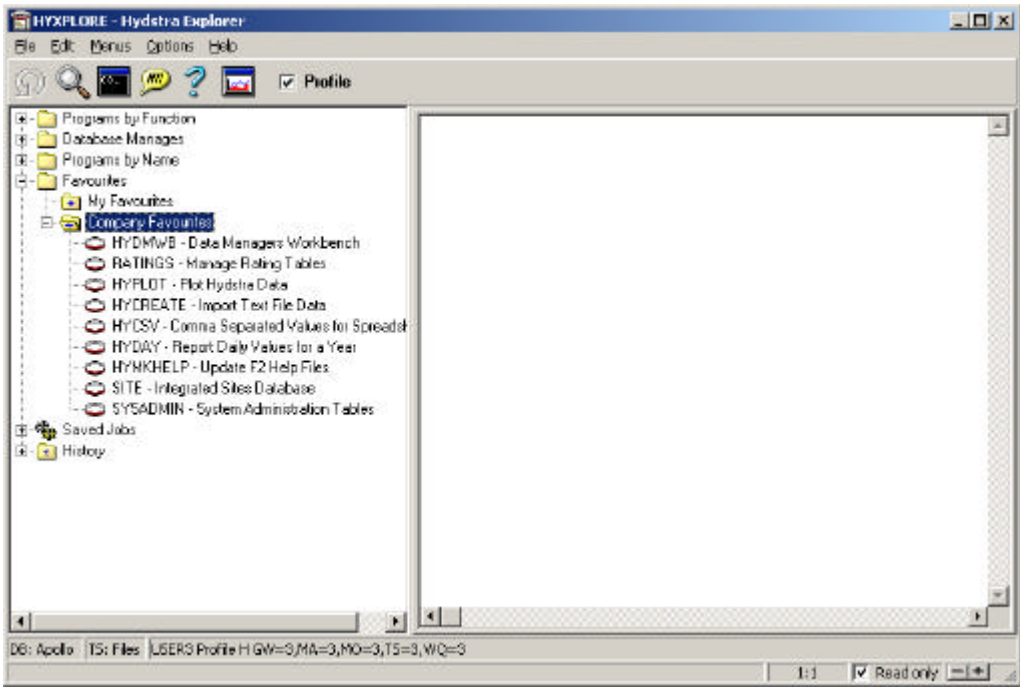
Multiple Axes on Graphs

As a side-benefit from the multi-variate time series editor, time series graphs now have the option of multiple axes (ie: one per trace).

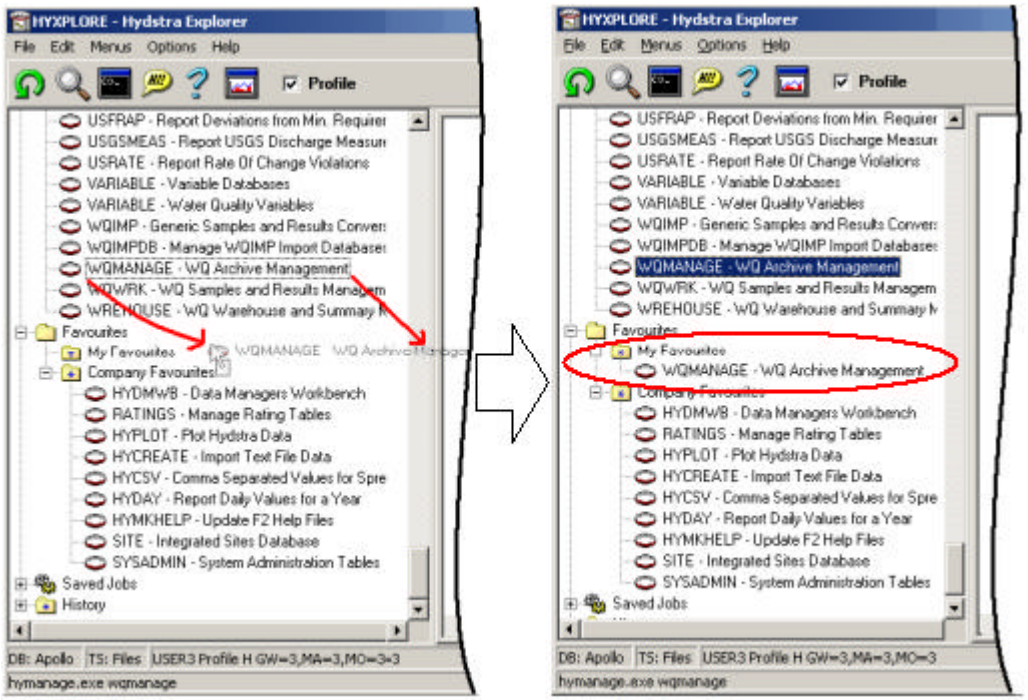
Favourites in Hydstra/TS HYXPLORE

By Damian Skinner, Client Services Consultant

In HYXPLORE there is a "Favourites" menu that gives you quick access to the programs that you use on a regular basis. The list of programs offered under the Favourites icon is configurable so that each user can have quick access to their own personal favourites.



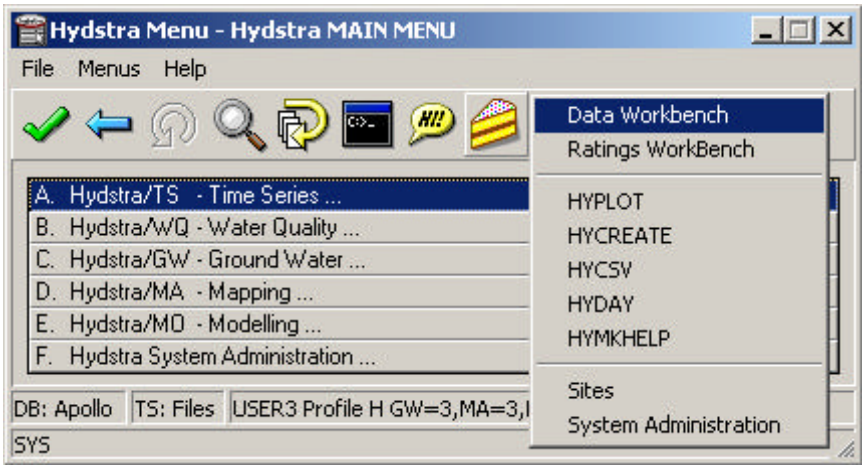
Favourites are defined by clicking on a menu entry and dragging it into the Favourites Menu. For example, to add WQMANAGE to your personal favourites, you would first find the existing menu entry under "Programs by Name". Then you would click on the WQMANAGE icon and drag it onto your "My Favourites" folder. This creates a new copy of



Favourites in Hydstra/TS HYMENU

By Damian Skinner, Client Services Consultant

In the HYMENU toolbar there is a “Favourites” icon that gives you quick access to the programs that you use on a regular basis. The list of programs offered under the Favourites icon is configurable so that each user can have quick access to their own personal favourites. This article discusses how to set up your own personal favourites in FAVOURIT.INI.



Favourites are defined in the [Favourite Programs] section of FAVOURIT.INI. Each favourite is defined by a “keyword=value”, where the keyword is the text to display in HYMENU, and the value is the name of the program to run. The program is assumed to be in your RUNPATH directory unless a full path is used.

```
[Version]
Version = 1

[Favourite Programs]
Data Workbench        = hydmwb.exe
Ratings WorkBench     = hyrated.exe
 -                    = c:\temp\DummyEntry.bat
HYPLOT                = hyplot.exe !
HYCREATE              = hycreate.exe
HYCSV                 = hycsv.exe !
HYDAY                 = hyday.exe !
HYMKHELP              = hymkhelp.exe
 -                    = c:\temp\DummyEntry.bat
Sites                 = hymanage site
System Administration = hymanage sysadmin
```

HYMENU will look for FAVOURIT.INI in the same way as Hydstra/TS looks for all INI files, which means that it will start looking in your TEMPPATH directory, where your own personal preferences live. If HYMENU can’t find FAVOURIT.INI in your TEMPPATH directory then it will look in your INIPATH folder, where your organisational preferences live. If HYMENU still can’t find the INI file then it will look in MISCPATH, where the Hydstra defaults live.

To set up your own personal favourites, copy FAVOURIT.INI from your MISCPATH folder to your TEMPPATH folder and modify the keyword=value lines in [Favourite Programs]. The new favourites will appear the next time you start HYMENU.

Producing Report Images in Hydstra/TSM

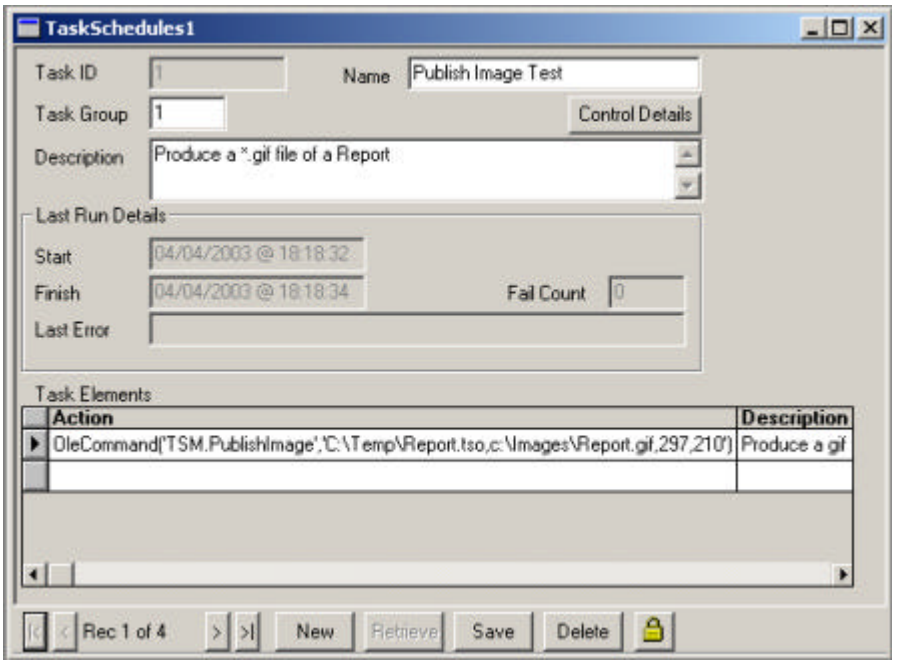
By Will Alderton, Technical Programmer

Hydstra/TSM provides a mechanism for generating graphical images of reports (for example, a time series plot). These images can be either a bitmap, jpeg, gif or enhanced metafile of a report or plot, and the process can be automated using Scheduler. This is achieved by setting up a task using the Task Schedules form. The following line shows the syntax needed for the task element:

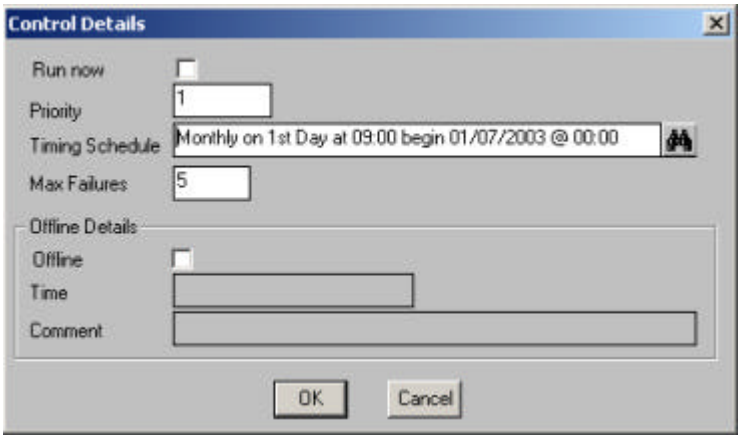
```
OleCommand(TSM.PublishImage,"FileName,ImageFile,width,height,
ParametersFile")
```

Note that the "ParametersFile" is optional.

The following is an example of a Time Series plot named "Report.tso" which has been saved in the C:\Temp directory. The task schedules form should be set up as follows to produce a gif image file of the report in the C:\Images directory:

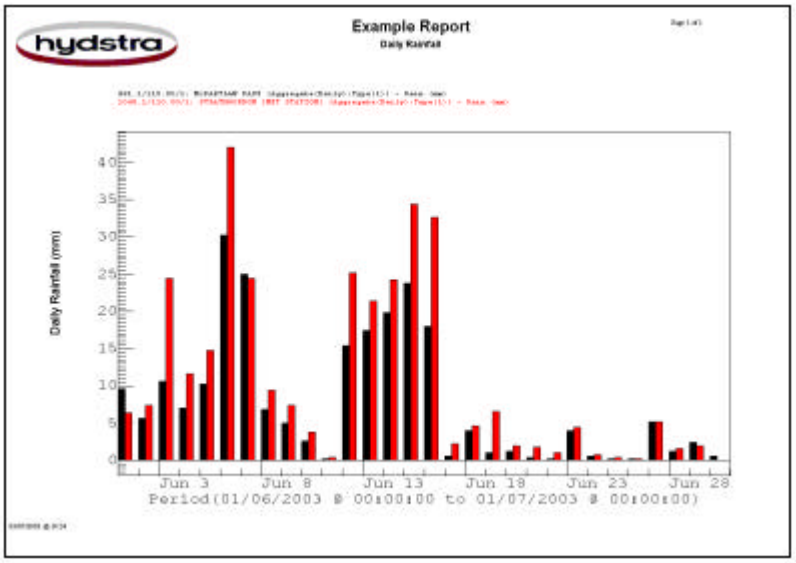


By clicking the "Control Details" button, the timing schedule can be set up for this task. In this case, it is run at 9am on the first day of each month:



Producing Report Images in Hydstra/TSM (continued)

Once the task is run an image named "Report.gif" is created in C:\Images:



In the above example, no "ParametersFile" was specified in the Task element. Reports can be set up as batch jobs in Scheduler in order to create a whole series of similar reports (for example a time series plot of daily rainfall for two sites situated near to each other). In order to do this the report must be "parameterised". A report *parameter* can be any component of a saved Hydstra/TSM report. It could be anything from the site identifier through to the colour of the text. For example, if you have a time series plot report for which you want to obtain copies for several different sites, you can modify the saved data summary file (.tso) so that when you preview it, the report prompts you for the appropriate identifiers.

The parameter of the report you wish to edit simply needs to be replaced in the .tso file with ~{<Name>||<Parameter>}~. For example, using Report.tso, we may wish to specify the two Site.Locations for which the daily rainfall plot is generated. By opening Report.tso as a text file (i.e. in Notepad), the two generated plots are as shown below.

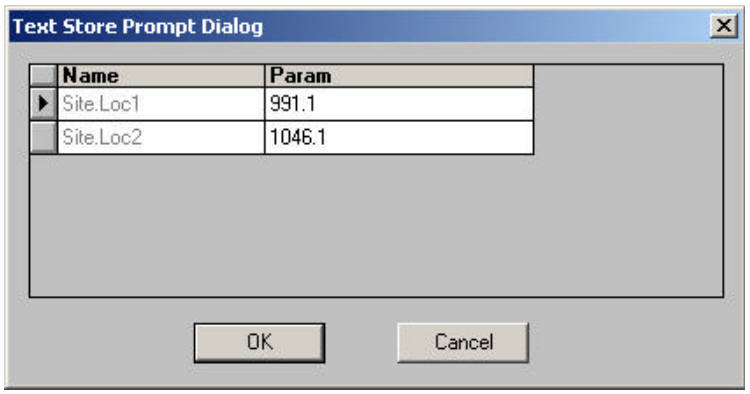
```
Trace
  {
  Source=ProcSrc(TSM(991.1/110.00/1),Aggregate(Daily);Type(1))
  ...
  Source=ProcSrc(TSM(1046.1/110.00/1),Aggregate(Daily);Type(1))
```

The information that we wish to change or parameterise each time the report is generated are the two Site.Locations. To do this, modify the above lines in Report.tso as follows:

```
Trace
  {
  Source=ProcSrc(TSM(~{Site.Loc1||991.1}~/110.00/1),
         Aggregate(Daily);Type(1))
  ...
  Source=ProcSrc(TSM(~{Site.Loc2||1046.1}~/110.00/1),
         Aggregate(Daily);Type(1))
```

Producing Report Images in Hydstra/TSM (continued)

Now, when you open the report, whether to preview it or to further customise it the following dialog appears:



In this dialog, the two site and locations for which the plot is to be generated can be changed. Once the report (.tso) is parameterised all that remains to do is to create a text file containing the parameters that you wish Scheduler to pass to the report when it runs. The following "Params.txt" file has been created in the C:\Temp directory:

```
[StrathgordonAndMcCartlanPass]
Site.Loc1=991.1
Site.Loc2=1046.1
[HentyCanalAndLkPlimsoll]
Site.Loc1=283.1
Site.Loc2=294.2
```

Now to automate this process, just add the path of the parameters file to the task element. In this case the line

```
OleCommand('TSM.PublishImage','C:\Temp\Report.tso,
          c:\Images\Report.gif,297,210')
```

becomes

```
OleCommand('TSM.PublishImage','C:\Temp\Report.tso,
          c:\Images\Report.gif,297,210, C:\Temp\Params.txt')
```

This will then produce two reports, named "Report_StrathgordonAndMcCartlanPass.gif" and "Report_HentyCanalAndLkPlimsoll.gif". Looking at the [HentyCanalAndLkPlimsoll] section in Params.txt, when scheduler runs the task then a substitution is made so that the following lines

```
Source=ProcSrc(TSM(991.1/110.00/1),Aggregate(Daily);Type(1))
Source=ProcSrc(TSM(1046.1/110.00/1),Aggregate(Daily);Type(1))
```

become

```
Source=ProcSrc(TSM(283.1/110.00/1),Aggregate(Daily);Type(1))
Source=ProcSrc(TSM(294.2/110.00/1),Aggregate(Daily);Type(1))
```

This useful tool can be used to produce an image of a report in a particular location where it can then be uploaded to the Internet for example.

Using Hydstra/TS to Calculate Total Maximum Daily Loads (TMDL) at Riverside County Flood Control and Water Conservation District

By Patrick Hayes, Vice President, Hydstra America Inc.

The Riverside County Flood Control and Water Conservation District (Riverside), Riverside, California, has been using Hydstra software for four and a half years. They run the Time Series, Mapping and Water Quality modules to manage their surface water and water quality data throughout the District, and have been quite happy with its capabilities.

Part of their job is to manage waterways in their domain so that they meet the requirements of the Clean Water Act (CWA). The CWA, originally passed by Congress in 1972, and modified several times since, mandates that the nation's rivers, lakes and streams be fishable and swimable. Congress authorized grants to agencies to implement point source controls. In the first 15 years of the Act, over US$60 Billion was expended on enhanced sewage treatment efforts and the like.

If initial efforts at point source control do not achieve the goals, then a second stage of best management practices are required. In this second stage, a study must be done to determine the **Total Maximum Daily Load (TMDL)** that a water body can tolerate, and still achieve the basin plan objective goals. Once this amount is determined then controls are implemented to limit the TMDL to the proscribed level.

Presently, there are a very large number of impaired waterways throughout the US. Impaired waterways are those which have not met the goals of the Clean Water Act. In California alone, there are over 1,500 impaired waterways. Each of these will require a TMDL Study.

Various pollutants are responsible for the impairments. In the case of Lake Elsinore, Riverside County, California, the pollutants presently in question are nutrients. Riverside has been collecting data from the Lake Elsinore catchment for a number of years relating to stream flows, water levels and rainfall. More recently they have also been collecting water quality information over a range of parameters, including sediments. All of these data have been stored in their Hydstra database.

In order to perform the TMDL Study, Riverside had to calculate the total nutrient loads entering the water body. As they have on several previous occasions, they approached Hydstra America, Inc. about writing customized software to make these calculations. The process of performing these calculations is not particularly onerous but several user level decisions have to be made in order to compare the continuously sampled storms to the non-sampled storms. Having all the data in one place is the key to making the job easy. Hydstra has a significant advantage in this area as all of the data are already available in Riverside's Hydstra software.

Hydstra America undertook the job and developed a complete computation package that allows the Riverside client to perform loadings calculations and report on the findings. The State of California Water Resources Control Board is responsible for the enforcement of the CWA in California. They have subdivided these responsibilities into regions, and the Santa Ana Regional Water Quality Control Board (SARWQCB) oversees the enforcement for the Lake Elsinore area. The SARWQCB, however, has no database nor computer analysis capability to perform TMDL. Consequently, the Board contracted with an engineering firm to build a TMDL model with the BASINS program (EPA modeling program) to model the response of the watershed to changes in the pollutant loads. Hydstra's loading program has been helpful in checking the loading rates and calibration of the BASINS model. Response from the regulatory agency has been quite positive and Riverside hopes to use the new tools for other TMDL applications in the future.

The Hydstra TMDL tools are available to all Hydstra/TS users in the latest upgrade.

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Hydstra Pty Ltd provides an integrated suite of software and services for the management of environmental data, with a particular emphasis on renewable energy, water resources and urban water. Hydstra brings together two world leaders, HYDSYS and TimeStudio, to offer a complete solution to environmental data management. Hydstra software is aimed at organisations who need to manage large amounts of environmental data.

Hydstra provides leading edge solutions in:

- Data Acquisition
- Data Management
- Data Analysis
- Modelling and Simulation
- Automated Task Scheduling

Hydstra also provides ongoing support to make sure that you continue to get the most you can out of the software.

- Migrate your existing data archive
- Streamline your data acquisition procedures
- Set up automated data auditing and web publishing systems
- Ongoing training

Hydstra has a proven track record in providing first-class software and support , with over 150 installations in 22 countries around the world.

Hydstra Pty Ltd is a wholly owned subsidiary of Hydro Tasmania and brings with it the support of the Hydro Tasmania Consulting Division.

www.hydstra.com